学校编码：10384　　分类号_____密级 _____
学号：　27720141154632　　UDC_____

厦门大学

硕 士 学 位 论 文

上市公司破产风险与盈余管理-传统 Altman's Z 得分模型是破产风险的合理代理变量吗？：来自美国股市的实证研究

Bankruptcy Risk and Earnings Management—Is the Conventional Altman's Z-Score Model Appropriate for Bankruptcy Proxy? : An Empirical Study on the U.S. Stock Market

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论文提交日期：　2016　年　3　月
论文答辩日期：　2016　年　5　月
学位授予日期：　　年　　月

答辩委员会主席：
评　阅　人：

2016 年 3 月

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摘要

本文通过利用美国股票市场 2012-2014 年的公司股票收益率，研究了公司破产风险和公司盈余管理之间的关系，实证结果表明公司破产风险和盈余管理之间存在着统计显著的负向关系，即那些具有低破产风险的公司（等价于那些具有更低财务压力的公司）相比于高破产风险的公司更加倾向于盈余管理，再次基础上本文更进一步探讨了传统上广泛使用的 Altman's Z-score 方法是否可作为公司破产风险的合理代理，本文的实证发现传统 Z-score 方法并不成立。

关键词：破产风险；盈余管理；Altman's Z-score

Abstract

This paper examines the relationship between bankruptcy risk and earnings management by conducting an empirical study on the U.S. stock market. Data from year 2012-2014 is employed. The result shows that bankruptcy risk and earnings management are negatively related. That is, firms with low risk of bankruptcy (i.e. low financial distress) tend to engage in higher earnings management. In addition, using this empirical study on bankruptcy risk and earnings management, I further investigate whether "Altman's Z-score" model, a widely-used model for bankruptcy evaluation, is still appropriate as a bankruptcy proxy. The result from this empirical study shows that the conventional model does not hold.

Key words: bankruptcy risk; earnings management; Altman's Z-score

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Chapter 1: Introduction

Financial statements are purposely conducted to report firm's financial information, such as financial performance, financial position, and cash flows. Therefore, financial statements are useful tools to various types of users when they make economic decisions.[1] However, if financial statements are not properly reported and contain falsified financial figures which do not reflect underlying economic financial position or performance of the entity, financial statements users (e.g. investors, creditors) may make wrong economic decisions. Hence, this could eventually affect the economy as a whole. According to "PwC Global Economic Crime Survey 2014", it is reported that economic crime, such as fraud, corruption, or accounting fraud, continues to be a major issue for organizations of all sizes across all globe and in every sector. Accounting fraud is reported at 22 per cent of all the most commonly reported types of economic crime. According to "2012 Global Fraud Study" by Association of Certified Fraud Examiners (ACFE), the portion of financial statements fraud was conducted approximately 8 per cent of the cases they investigated. Although the number of cases is slightly small, its impact was very high. The organization discovered that financial statement fraud has a highest median loss of $1 million.

Over the past decades, studies related to earnings management have received increasing attention. Several world accounting scandals, such as Enron, WorldCom, and Xerox, have emphasized the significance of the quality of financial reports in response to incentives associated with a specific event, one of those being the firm's financial health (DeAnglo, DeAngelo, & Skinner, 1994; Rosner, 2003; Charitou, Lambertides & Trigeorgis, 2011; Agrawal & Chatterjee, 2015).

As shown by existing studies, there are many reasons why the management might find earnings management desirable. For instance, Roychowdhury (2006) finds that earnings manipulation is used to conceal negative earnings, Matsumoto (2002) provides results that firms resort to earnings manipulation to avoid negative earnings surprises, Sweeney (1993) documents that firms conduct earnings management to reduce the risk of breaching debt contracts. Some scholars find evidence supporting

[1] "The Framework for the Preparation and Presentation of Financial Statements". International Accounting Standards Board. Accessed 28 January 2016.

that distressed firms use income-increasing techniques to hide their financial problems (Burgstahler & Dichev, 1997; Rosner, 2003; Beneish, Press, & Vargus, 2011). Nevertheless, some discover that firms with financial difficulties employ downwards earnings management during the year surrounding contractual renegotiations so that they could achieve better negotiations (e.g. with banks or labor unions) or government assistance (DeAngelo et. al 1994; Saleh & Ahmed, 2012).

This paper considers the impact of bankruptcy risk on earnings management. The purpose of this thesis is to measure the effect of bankruptcy risk on earnings management. On the other hand, many studies apply the Altman's Z-score model[2] to indicate bankruptcy possibility. However, the individual components of Altman's Z-score do not have the same marginal effects on earnings management as those of the condensed Altman's Z-score. Hence, if we restrict ourselves to look at the relationship of earnings management and Altman's Z-score, these important differences are obscure. This paper, therefore, also takes this inappropriateness into consideration and statistically shows that these marginal effects are indeed different as well as quantifies how these individual effects differ.

This thesis provides insight analysis on the study of bankruptcy risk and earnings management. Accordingly, the results will be of interest to financial statement users—shareholders, investors, lenders, auditors, financial analysts—who need to consider the reliability of financial statements. In addition, by using modern time's data and the context regarding the relationship of bankruptcy risk and earnings management, the paper investigates whether the "Altman's Z-score model", which is a widely-used model for bankruptcy risk evaluation, is still reasonable. As a result, this research will benefit both financial statement users and academic researchers.

The rest of the paper is structured as follows. Literature review related to this empirical study is presented in chapter 2. Chapter 3 illustrates data and methodology for this empirical study. Chapter 4 presents empirical results which include multiple regression results and results of multiple linear restrictions testing. Chapter 5 concludes key findings and provides suggestions for further study.

[2] The Altman's Z-score model has been extensively used to evaluate the overall firm's bankruptcy probability. Higher values of the score represent lower level of bankruptcy risk. (Apergis, Sorros, Artikis, & Zisis (2011)).

Chapter 2: Literature Review

This chapter discusses literature review regarding the issue of bankruptcy risk and earnings management. Firstly, I will begin with the discussion on conceptual framework related to this issue. As the issue on bankruptcy risk and earnings management, in particular, can be viewed as an agency problem, literature review related to agency theory will be provided at the beginning of the chapter. After that, I will further discuss what earnings management is and how to measure earnings management. Next, I will discuss about a particular variable of interest which is bankruptcy risk as well as data used to measure the risk. Other related literature, including literature related to bankruptcy risk and earnings management, other factors affecting the relationship between bankruptcy risk and earnings management, as well as the Altman's Z-score model will be illustrated towards the end of this chapter.

2.1 The Conceptual Framework

2.1.1 Agency theory

Jensen and Meckling (1976) explain that an agency relationship involves two parties—the principal(s) and the agent. The principal appoints the agent to deliver managerial services, and the agent receives some authority for decision making. Nonetheless, the agent may not best perform for benefits of the principal(s). Therefore, the principal can mitigate the risk of having agency problems by initiating some incentives to motivate the agent and by paying some costs to control or investigate any harmful actions that may arise.

Eisenhardt (1989) illustrates that agency problems can occur from two situations. That is, when the principal and the agent have different goals as well as when the principal cannot assess whether the agent behaves properly or not. Agency problem is a goal conflict which occurs when individuals with different preferences cooperate with each other. The theory assumes that individuals seek to work for their own interest and goal conflict arises at the organizational level. Additionally, individuals are rational

and asymmetric information normally occurs in the organization. As a result, two agency problems arise.

- *Moral hazard* is defined as the situation when the agent may not put as much effort as agreed.
- *Adverse selection* is defined as the situation when the principal cannot judge whether or not the agent is qualified for the job even when the agent is on duty or when he/she is being hired.

In order to mitigate the problems, the principal can incur two types of agency cost to tie the employees' interests with shareholders' interests.

- *Behavior-oriented costs* refer to costs incurred to control behaviors or actions of the agent, for instance, the principal can establish information system. A relevant example is to establish board of directors to monitor executives' behaviors.
- *Outcome-oriented costs* refer to costs incurred to control results of an action of the agent, to name a few, commission to motivate the agent to increase sales figure, golden parachutes, and executive stock holdings.

These problems could be mitigated by using external mechanism, such as 'merger or acquisition'. That is, if investors perceive that the firm is not performing well because of the poor management, investors may take over the company and fire the management. Having internal behavioral controls such as using appropriate information systems (e.g. budgeting, board of directors) could also help decrease the agent's opportunism and thus allows the principal to monitor the agent to best act for the interest of shareholders. Richardson (1998) finds that information asymmetry is positively related to income-increasing accruals. This suggests that information asymmetry provides opportunity for the management to manipulate earnings. With information asymmetry, stakeholders may not see through earnings manipulation as they lack relevant sources of information to effectively monitor the management's actions.

Srichanpetch (2008) explains that agency theory views the owner of a company cannot operate the entity by himself and thus it is necessary to hire someone to manage the company. Hence, the principal (i.e. the owner/shareholder) and agent (i.e. the management) relationship incurs. The agent should not aim for the benefits for

self-interests but to do their best for the benefits of shareholders e.g. to maximize the value of the company to increase shareholders' wealth. Nonetheless, a lot of problems could arise during operations. For instance, the executive management might not have sufficient ability to manage the company or the management may take an opportunity to obtain the company's benefits for their self-interests. Consequently, agency problems occur.

To sum up, earnings management can be considered as an agency problem. Agency theory provides framework for more understanding about why earnings management occurs. According to the aforementioned literature, it can be concluded that the management has some economic incentives to manipulate financial figures. When the company is experiencing unsatisfactory financial performance, the management may choose to conduct earnings management to modify actual financial results of the company to either cover their true abilities or to utilize the opportunism for their own interests (e.g. maintaining job security).

2.1.2 Earnings management

Referring to Schipper (1989)'s definition, earnings management is "the sense of a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain (as opposed to say, merely facilitating the neutral operation of the process)."… "A minor extension to the definition would encompass "real" earnings management, accomplished by timing investment or financing decisions to alter reported earnings or some subset of it."[3]

According to SEC Chairman Levitt (1998), "earnings management is a gray area where the accounting is being perverted; where managers are cutting corners; and, where earnings reports reflect the desires of management rather than the underlying financial performance of the company."[4]

Healy and Wahlen (1999) say that "earnings management occurs when the management's judgment in financial reporting and in structuring transactions to alter

[3] See more detailed definition in Schipper (1989)'s paper.
[4] See more detailed definition in Levitt (1998)'s paper.

financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers"[5]. Consistent with a lot of earnings management literature, the authors conclude managers can take advantages of earnings management mainly for the following purposes:

- To influence stock market perceptions by adjusting financial reports before public offerings e.g. initial public offerings or secondary offerings.
- To maintain job security or enhance compensation.
- To mitigate the risks of breaching loan agreements.
- To avoid interventions from the regulatory authorities.

Dechow and Skinner (2000) explain that accounting choices made within the boundaries of Generally Accepted Accounting Principles (GAAP) could be viewed as earnings management if they are used to lure actual financial results of the company. Earnings management and financial fraud are actually not the same. Earnings management refers to those accounting choices within the boundaries of GAAP, such as overstating provisions and postponing revenues. However, accounting fraud refers to those accounting practices that contradict with GAAP rules, for instance, creating fake sales invoices to inflate revenues.

Nonetheless, Magrath and Weld (2002) state that it is necessary to correctly define "earnings management" since the SEC and accounting profession admit the truth that some earnings manipulation methods are not considered as frauds.

Weil (2009) provides explanation that earnings management is not a technical term in accounting or finance. However, it occurs when there is opportunism for the management to exercise discretion to alter reported financial earnings.

Rahman, Moniruzzaman, and Sharif (2013) define earnings management as management decisions to report stable and predictable financial figures[6]. The management exercises judgment to manipulate the firm's earnings so that the financial results meet the forecast figures. Earnings management is considered as the

[5] See more detailed definition in Healy and Wahlen (1999)'s paper.
[6] See more detailed definition in Rahman, Moniruzzaman, and Sharif (2013)'s paper.

management's effort to use specific accounting methods to manipulate earnings within the boundaries of accounting standards. Although earnings management is said to be unethical, it is not always illegal. More importantly, it is a method that the management uses to maximize the value of the firm while reducing risk. The authors also emphasizes that there are many motivations behind the use of earnings management. Some of the most important ones are:

1) Stock market motivation
2) Signaling or concealing private information motivation
3) Personal incentives motivation
4) Firm's internal motivation (e.g. budget goals)
5) Management compensation contract motivation
6) Lending contract motivation
7) Regulatory motivation

Omar et al. (2014) explain that earnings management is a well-known method managers use to manipulate accounting numbers. However, this does not mean these activities are illegal. Since managers have flexibility to choose accounting or operating methods, there is room for them to manage earnings. There are several techniques used for earnings management. See Omar et al. (2014)'s paper for an extended discussion of the twelve most popular earnings management techniques.

In summary, earnings management implies an act of altering financial results which do not reflect true performance of the company. Several accounting techniques can be used to achieve such purpose. As accounting choices are provided for the management to choose, the management can take advantage of this opportunism by exercising discretion on accounting methods to conduct earnings manipulation. As a result, financial statements can be falsified and thus mislead financial statement users when making economic decisions. Since there is still no clear concurrence on how to define earnings management, one should exercise judgment when interpreting results of researches regarding earnings manipulation detection (Beneish, 2001).

Earnings management determinants

There are various ways to detect earnings management. Some scholars study earnings management by using accruals, changes in disclosures, or real activities manipulation[10] (Siddharth, 2011). Nevertheless, the majority of them prefer using discretionary accruals as a measurement of accounting choice to test earnings management hypothesis. From management's point of view, accruals are favorable for manipulating accounting numbers owing to their low costs[11]. As accrual-based measurements combine the net effect of various accounting policies into one number, they can better analyze income manipulation (Watts & Zimmerman, 1990; Young, 1999). Several studies consider that discretionary accrual is a good measurement for earnings management determination. Hence, they apply discretionary accruals to investigate income manipulation. Some of the researches that apply discretionary accruals as an earnings management determinant are, for instance, Ayes, Jiang, and Yeung (2006), Chtourou, Bédard, and Courteau (2001), as well as Bergstresser and Philippon (2005). For this reason, this paper applies discretionary accruals as a measurement for earnings manipulation.

According to Healy (1985), accruals are defined as the difference between cash flow from operations and net income. Total accruals consist of two parts which are nondiscretionary accruals and discretionary accruals. Nondiscretionary accruals refer to accruals imposed by accounting regulatory authorities, such as the Securities Exchange Commission (SEC) and the Financial Accounting Standards Board (FASB). Basically, nondiscretionary accruals are accruals or adjustments to cash flows that comply with accounting standard rules, for example, fixed assets must be depreciated in some systematic manner. This type of accruals occurs from normal operations and is not caused by the management's discretion to manipulate earnings. In contrast, discretionary accruals refer to cash flows' adjustments that the management exercises discretion to alter financial figures. Since the management is given opportunities to select accounting methods specified in the accounting standards, the management can take advantage of this opportunism to manage earnings. For instance, the manager can choose to expedite or defer delivery of inventory at year end, or he can alter the method to depreciate fixed assets from year to year to alter reported financial results.

[10] See further explanation of real activities manipulation in Roychowdhury (2006)'s paper.
[11] See further explanation in Young (1999)'s paper.

In a nutshell, accruals can be used to delay or accelerate timing of reported earnings. This implies that "discretionary accruals" allow managers to modify earnings from period to period. Therefore, once discretionary accruals are measured, financial statement users can infer from the results whether the management engages in earnings manipulation or not.

Dechow, Sloan, and Sweeney (1995) explain that discretionary accruals are commonly considered as a measurement to analyze earnings manipulation. To do so, it is recommended that a model to measure discretionary portion of the accounting earnings should be used. Scholars have developed many models, ranging from basic models which assume discretionary accruals and total accruals portions are the same to more complicated ones in which total accruals are separated into nondiscretionary and discretionary portions. The authors choose five accruals-based models to evaluate the measurement effectiveness for detecting earnings management. The authors come to the conclusion that, among all the five alternative methods, the "modified Jones model" is the most effective model to capture management's earnings manipulation. Therefore, this paper also uses the modified Jones model to derive discretionary accruals. The modified Jones model is as follows[12].

The Modified Jones Model (Developed by Dechow, Sloan, and Sweeney (1995))

$$NDAC_{it} = \hat{\alpha}_1 \frac{1}{Assets_{it-1}} + \hat{\alpha}_2 \frac{\Delta REV_{it} - \Delta REC_{it}}{Assets_{it-1}} + \hat{\alpha}_3 \frac{PPE_{it}}{Assets_{it-1}}$$

where

$NDAC_{it}$	=	Nondiscretionary accruals for firm *i* in year *t*
$Assets_{it-1}$	=	Total assets for firm *i* in year *t-1*
ΔREV_{it}	=	Revenues for firm *i* in year *t* less revenues for firm *i* in year *t-1*
ΔREC_{it}	=	Net receivables for firm *i* in year *t* less net receivables for firm *i* in year *t-1*
PPE_{it}	=	Gross property, plant, and equipment for firm *i* in year *t*
$\alpha_1, \alpha_2, \alpha_3$	=	Firm-specific parameters

[12] For the other models, see more details in Dechow et al. (1995)'s paper.